Department of the Army
Pamphlet 385–80

Safety

Hospital/Medical Facility Safety Management

Headquarters
Department of the Army
Washington, DC
4 September 2007

UNCLASSIFIED

SUMMARY of CHANGE

DA PAM 385–80
Hospital/Medical Facility Safety Management

This new pamphlet, dated 4 September 2007--

- Adds hospital/medical safety procedures for military medical facilities (chap 1).
- Establishes mishap/accident reporting guidelines (chap 2).
- Provides guidance on self-inspections, evaluations, and surveys (chap 3).
- Clarifies hazard reporting and abatement (chap 4).
- Establishes medical facility/hospital physical plant safety requirements (chap 5).
- Adds the requirements for safe laboratory operations (chap 6).
- Identifies hospital safety hazards (chap 7).
- Adds hospital hazard recognition involving health care risks, Joint Commission on Accreditation of Healthcare Organizations standards, and care core processes (chap 8).
- Provides guidance on the Safety and Occupational Health Advisory Committee (chap 9).
- Adds fire prevention and protection standards for the healthcare safety program (chap 10).
- Adds electrical safety guidelines for the medical facility and its grounds (chap 11).
- Adds guidance for prevention of stress for hospital workers (chap 12).

Headquarters
Department of the Army
Washington, DC
4 September 2007

Department of the Army Pamphlet 385–80

Safety

Hospital/Medical Facility Safety Management

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the Secretary of the Army

History. This publication is a new Department of the Army pamphlet.

Summary. This pamphlet provides new guidance regarding the policies prescribed in AR 385–10, Army Safety Program. It is designed to assist users in implementing hospital/medical safety and occupational health standards and procedures into medical treatment facilities, with special emphasis on patient, visitor and staff safety. It establishes a central source for hospital/medical safety and occupational health program management criteria. Further, it provides implementing instructions for the safety officer regarding requirements for medical treatment facility operations to ensure compliance with the Occupational Safety and Health Act of 1970 as directed in Executive Order 12196; part 1960, title 29, Code of Federal Regulations; Department of Defense Directive 1000.3; Department of Defense Instruction 6055.1, and the Joint Commission on Accreditation of Healthcare Organizations Environment of Care Standard.

Applicability. This pamphlet applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve, unless otherwise stated. This pamphlet applies to Army civilian employees, and others involved in or affected by Army operations worldwide. During mobilization, procedures in this publication can be modified to support policy changes as necessary.

Proponent and exception authority. The proponent of this publication is Chief of Staff, Army. The proponent has the authority to approve exceptions or waivers to this pamphlet that are consistent with controlling law and regulations. The proponent may delegate this approval authority, in writing, to a division chief within the proponent agency or a direct reporting unit or field operating agency, in the grade of colonel or the civilian equivalent. Activities may request a waiver to this pamphlet by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through higher headquarters to the policy proponent. Refer to AR 25-30 for specific guidance.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Director of Army Safety, (DACS–SF), 200 Pentagon, Washington DC. 20310–0200.

Distribution. This publication is available in electronic media only and is intended for command levels A, B, C, D, and E for the Active Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve.

Contents (Listed by paragraph and page number)

UNCLASSIFIED

Contents—Continued

Contents—Continued

Figure List

Contents—Continued

Chapter 1
Healthcare–Hospital/Medical Safety Procedures

1–1. Purpose

Hospitals are historically unsafe places to work. Experience indicates that the injury rate at medical care facilities is higher than the rate at many industries. Most of the injuries result from slips, trips, and falls or from using incorrect lifting techniques, especially when lifting patients. Therefore, hospital staff must exercise great care in protecting themselves and ensuring a safe environment for the patients as well as those who enter the hospital. The staff must be alert and identify any hazards in order to provide an environment free from unsafe acts or unsafe conditions. To accomplish this goal, all levels of the hospital staff, functional managers, supervisors, and employees must be vigilant in the performance of their jobs to eliminate practices or conditions that could result in injury to patients, visitors, or employee's damage/loss to property.

1–2. References

Required and related publications and prescribed and referenced forms are listed in appendix A.

1–3. Explanation of abbreviations and terms

Abbreviations and special terms used in this pamphlet are explained in the glossary.

1–4. Medical treatment facility

To make the medical treatment facility as safe as possible, procedures will be established to—

a. Report any unsafe act or condition.

b. Contact housekeeping to remove any foreign material or liquid observed on floors.

c. Train staff on relevant work procedures and safe work practices, to include—

(1) Correct lifting and handling procedures (especially when working with patients) to prevent back, muscle, or hernia-type injuries which frequently result from incorrect lifting techniques.

(2) The dangers of horseplay or practical jokes.

(3) Procedures for marking and discontinuing use of damaged or defective equipment and immediately reporting broken equipment to medical maintenance.

(4) Procedures for reporting all injuries, however slight, to their supervisor and getting immediate first aid.

(5) Procedures for discarding needles, syringes, and sharp instruments in approved sharps containers. Disposal of needles and syringes disposal in healthcare facilities will comply with the current Occupational Safety and Health Administration (OSHA) Bloodborne Pathogen Standard, the recommendations of the Center for Disease Control (CDC), the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and the Environmental Protection Agency (EPA).

(6) Procedures for providing training and wear of appropriate protective clothing and equipment when using cleaning solutions, solvents, caustics, and so forth; or whenever the job requires protective clothing and equipment (such as in laboratories, shops, and so forth).

Chapter 2
Mishap/Accident Reporting

2–1. Reporting guidelines

All accidents/mishaps involving staff (military, civilian, and contractors), patients, and visitors, will be reported to the medical treatment facility safety office within 24-hours of occurrence. Reporting will be in accordance with AR 385–10. Reports shall be made both up the supervisory chain of command and to the first level of the organization where there is full time safety professional staff. Verbal, telephonic accident reports are preferable and in general, the 5 Ws (who, what, where, when, and why) of the accident should be covered. If a follow-on formal written report is deemed necessary, a safety professional organic to the medical unit typically will assist in its preparation.

a. The safety manager will compile and maintain accident/mishap data to identify trends.

b. The safety manager will maintain a log of occupational injuries and illness data to sustain the OSHA Form 300 (Log of Work-Related Injuries and Illnesses), which is the accident/injury log. The log is posted (in accordance with Title 29 Code of Federal Regulations 1904 (29 CFR 1904)) annually for all employees to review.

c. Civilian injuries are also reported to the servicing United States (U.S.) Army Civilian Personnel Advisory Center (CPAC) on the Department of Labor Form CA–1 (Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation).

2–2. Initial investigation

The supervisor will perform an initial accident investigation to determine facts and complete the supervisor portion of the required accident report. This report will then be forwarded to the commander for review and comments. The purpose of the accident investigation is to prevent recurrence.

2–3. Safeguarding accident reports

Accident reports will be safeguarded for use in accident prevention. Generally, accident reports are restricted to circulation only in safety channels and within the chain of command of the organization. They are not releasable to/for other functions such as line-of-duty investigation, report-of-survey, criminal investigation, or to support claims for or against the Army. If in doubt concerning release of the accident related material, consult with the Staff Judge Advocate (SJA) at the U.S. Army Combat Readiness Center.

Chapter 3
Inspections and Surveys

3–1. Self-inspections

a. Commanders and supervisors will use their developed program of self-evaluations to determine the effectiveness of their occupational safety and health programs.

b. Self-evaluations will include qualitative assessments of the extent to which their agency safety and health programs are developed, in accordance with the requirements set forth in Executive Order (EO) 12196 and 29 CFR 1960.

c. The medical treatment facility (MTF) safety manager will provide local inspection forms for use by medical center/hospital personnel.

d. Normal inspection intervals are annual (facility inspections), semiannual (patient care areas), quarterly (high interest areas), and monthly (safety-spot inspections).

3–2. Inspections, evaluations, and surveys

a. Spot Inspections.

(1) Spot inspections will be conducted at least monthly for high interest areas (those areas identified in the hazard risk analysis assessment).

(2) The results of the spot inspections will be recorded to ensure findings have been corrected and as a vehicle for follow-up, to monitor historical data on areas that have been corrected.

b. Annual/semiannual inspections, evaluations, and surveys.

(1) Safety, fire prevention, and health personnel conduct annual reviews of the unit's safety program and its effectiveness in preventing mishaps, as well as the annual facility inspections.

(2) Semiannual inspections are also required for all patient care areas.

(3) A representative of the official in charge of the workplace and a designated representative of the civilian employees in the workplace must be afforded the opportunity to accompany inspectors during the physical inspection of workplaces. Inspectors must consult personnel on matters affecting their safety and health.

(4) An in-brief and out-brief will be provided unless declined; an inspection report will be provided.

3–3. Occupational Safety and Health Administration inspections

a. Inspectors from the U.S. Department of Labor are authorized to conduct announced and unannounced inspections of all nonmilitary unique workplaces and operations where Army civilian personnel are employed.

b. A representative of the Garrison Safety office will accompany OSHA inspectors unless a U.S. Army Medical Command (USAMEDCOM) resource is targeted; then the MTF/activity safety officer will accompany the inspector.

c. The OSHA inspector will inspect only after meeting with the Garrison or hospital commander.

d. The Garrison or MTF/activity safety manager must accompany the inspector at all times.

Chapter 4
Hazard Reporting and Abatement

4–1. Introduction

It is vital to detect and promptly correct hazards at the lowest possible level. Hazards must be reported to the

responsible supervisor or local safety staff so corrective action may be taken. If the hazard is eliminated on the spot, no further action is required unless it applies to other similar operations or to other units or agencies.

4–2. Hazard reporting

Hazards may be identified/reported verbally to the supervisor, safety office, or by using Department of the Army (DA) Form 4755 (Employee Report of Alleged Unsafe or Unhealthful Working Conditions), Facility Management work order, Department of Public Works (DPW) work request, or spot inspection. Regardless of the method used, certain procedures must be followed.

a. If the hazard presents imminent danger, the supervisor or individual responsible for the area will take immediate action to correct the situation or apply interim control measures.

b. The safety staff will investigate the hazard, assign a risk assessment code (RAC), and will monitor corrective action until completion.

c. During the investigation, the evaluator discusses the hazard with the person who identified it, the responsible supervisor or manager, and other parties involved to validate the hazard. This discussion also determines the best interim control and corrective action for the hazard.

d. If the hazard is found to be a fire or health problem it is brought to the attention of the appropriate agency for corrective action, for example, fire department, preventive medicine, Garrison safety, MTF/activity safety office, and so forth.

e. A DA Form 4753 (Notice No. of Unsafe or Unhealthful Working Condition) will be provided by the safety office for posting of all RAC 1 or 2 hazards. The DA Form 4753 will remain in place for three days or until the hazard has been abated, whichever is longer.

f. If the hazard has not been abated within 30 days of identification, it will be placed on DA Form 4756 (Installation Hazard Abatement Plan). Status on all DA Form 4756s will be tracked monthly by the functional manager. Functional managers will prepare DA Form 4756 and forward to the validating agency (fire department, preventive medicine, Garrison safety, MTF/activity safety office, and so forth.) The validating agency will—

(1) Keep one copy for file.

(2) Submit one copy to Garrison Safety Office to be filed in the Master Hazard Abatement Plan.

(3) Return one copy to the functional manager.

(4) Track the hazard until it is abated.

Chapter 5
Medical Facility/Hospital Physical Plant

5–1. General

The medical facility is subject to most of the types of mishaps common to other locations frequented by workers and visitors. If the nature of the facility creates a false sense of security to many who enter; then there might be a tendency for carelessness. Patients, especially the sick and the elderly, are more prone to slips and falls.

a. Hospital grounds.

(1) Hospital grounds will be well maintained at all times. Power equipment such as mowers, hedge trimmers, and so forth, will not be left unattended.

(2) Hospital parking lots and walkways will be in good repair, kept free of debris, sand, gravel, snow, and ice. They will be illuminated in accordance with Illuminating Engineering Society Standards of North America (IESNA).

b. Parking areas.

(1) Pedestrian crosswalks will be marked and identified. Crosswalks across ambulance routes in the immediate vicinity of the medical facility will be posted with a warning sign stating, “Emergency Vehicle Route” as noted in figure 5–1 below.

(2) Emergency parking spaces will be established near the emergency room entrance.

(3) Ambulance parking areas should be located to allow best possible egress into the common emergency routes. Designated ambulance routes should not pass through a parking lot. Ambulances will be parked for immediate response in a forward direction; backing out of stalls will be avoided (see fig 5–2).

Figure 5–1. Example of hospital entrance

Figure 5–2. Example of ambulance parking

5–2. Entrances and exits

a. Each entrance to the facility will be appropriately identified.

b. Emergency room entrance signs will be illuminated.

c. Doormats will be in good repair and lie flat.

d. Clear glass doors and panels will be affixed with decals or other visible means to preclude being mistaken for an opening.

e. Elevated thresholds will be eliminated wherever possible.

f. Every exit will be clearly visible or the route to it conspicuously identified, so that every occupant of the building readily knows the direction of escape from all points.

g. Any doorway or passageway, which is not an exit or access to an exit but which may be mistaken for an exit, will be identified by a sign reading "Not an Exit" or a sign indicating its actual use such as "Storeroom."

h. Exits and accesses to exits will be marked by a readily visible sign. Each exit sign (other than internally

illuminated signs) will be illuminated by a reliable light source providing no less than 5 foot-candles on the illuminated surface (see fig 5–3).

Figure 5–3. Example of properly marked exits

i. Mirrors will not be placed on or near exits in a way that confuses the direction of the exit.

j. At no time will exits be blocked.

k. Identification of exits, illumination of exits, types, and numbers of exits will be in accordance with the National Fire Protection Association (NFPA) Standard 101, Life Safety Code.

5–3. Stairs and corridors

a. Stairways will be illuminated to a level of at least 20 foot-candles (see example of properly marked stairway exit doorway in fig 5–4).

b. Handrails will be installed on each stairway (see fig 5–5).

c. Bulletin boards or other similar distractions will not be located in or near stairways.

d. Stairs will be maintained in good repair and free from slippery surfaces.

e. Stairways and corridors should be wet mopped only one side at a time. “Caution Wet Floor” signs will be posted and slippery areas blocked off. Path for travel will be clearly identified for people using the corridor or stairs.

f. In stairways, doors at each floor level will be kept closed to provide a fire stop. With the approval of the authority having jurisdiction, doors may be held open with an automatic closing device installed according to instructions in NFPA 101.

g. Corridors and stairways will be kept free of unnecessary obstructions and will not be used as storage space. Nothing should be located in exit corridors.

Figure 5–4. Example of marked exit doorway

Figure 5–5. Example of stairway

5–4. Elevators

Facilities classified as healthcare or ambulatory occupancy in which patients are housed on floors other than ground level will have at least one elevator that will accommodate at least one adult size bed. Elevators will be equipped with a telephone or intercommunication system.

a. If elevators are not self-service, qualified and trained personnel will be assigned to operate them.

b. Elevators will be inspected according to instructions in American National Standards Institute (ANSI) A17.2, Practice for the Inspection of Elevators, Escalators, and Moving Walks.

5–5. Emergency power requirement

The requirement for emergency power is covered in NFPA 70, 99, 110, and current JCAHO Accreditation Manual.

a. Each medical facility will review and comply with these references. JCAHO standard requires that the hospital have an emergency power backup system (see example of a power backup generator in fig 5–6). The hospital maintains, tests, and inspects its emergency power systems.

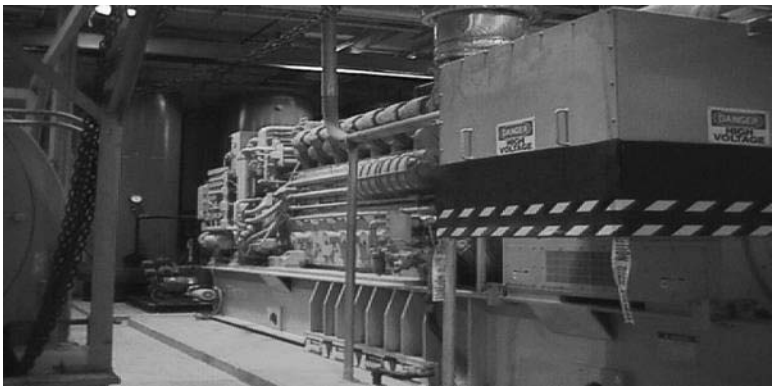

Figure 5–6. Example of power-backup generators

b. The hospital tests each generator 12 times a year with testing intervals not less than 20 days and not more than 40 days apart.

(1) These tests shall be conducted for at least 30 continuous minutes under a dynamic load that is at least 30% of the nameplate rating of the generator.

(2) Hospitals may choose to test to less than 30% of the emergency generator's nameplate. However, these hospitals shall (in addition to performing a test for 30 continuous minutes under operating temperature at the intervals described above) revise their existing documented management plan to conform to current NFPA 99 and NFPA 110 testing and maintenance activities.

(3) These activities shall include inspection procedures for assessing the prime movers' exhaust gas temperature against the minimum temperature recommended by the manufacturer.

(4) If diesel-powered generators do not meet the minimum exhaust gas temperatures as determined during these tests, they shall be exercised for 30 continuous minutes at the intervals described above with available emergency power supply systems (EPSS) load, and exercised annually with supplemental loads of—

(a) 25% of name plate rating for 30 minutes; followed by.

(b) 50% of name plate rating for 30 minutes; followed by.

(c) 75% of name plate rating for 60 minutes; achieving two continuous hours of testing.

(5) Additionally, the hospital must test all automatic transfer switches (ATS) 12 times a year with testing intervals not less than 20 days and not more than 40 days apart (see example of automatic transfer switches in fig 5–7).

Figure 5–7. Example of automatic transfer switches

c. The above is just a brief overview of the JCAHO requirement for generator and ATS testing. Safety and maintenance personnel should refer to JCAHO standard, NFPA 99 and 110 to ensure that optimum testing occurs and the hospital environment is maintained in a safe and healthy manner during the tests. Safety and maintenance personnel should work closely with facility management personnel and ensure a risk assessment is done before any testing takes place. The risk assessment is not a one time event for generator testing; it must be evaluated and validated before each monthly test.

5–6. Compressed gasses

The handling, care, and storage of compressed gases, cylinders, distribution systems, and devices for administering or otherwise using compressed gases will be in accordance with current NFPA codes and standards, Compressed Gas Association (CGA) pamphlets, U.S. Army Technical Manuals (TMs), and JCAHO requirements (see example of compressed gas storage unit in fig 5–8).

a. Applicable specific codes, standards, pamphlets, and technical orders are as follows:

(1) NFPA 50, Bulk Oxygen Systems at Consumer Sites.
(2) NFPA 53M, Fire Hazards in Oxygen Enriched Atmospheres.
(3) NFPA 99, Standard for Healthcare Facilities.
(a) Chapter 4, Gas and Vacuum Systems.
(b) Chapter 10, Laboratories.
(4) CGA Pamphlet G–4, Oxygen.
(5) CGA Pamphlet P-l, Safe Handling of Compressed Gases in Containers.
(6) CGA Pamphlet P–2, Characteristics and Safe Handling of Medical Gases.
(7) CGA Pamphlet P–2-l, Standard for Medical Vacuum Systems in Hospitals.
(8) CGA Pamphlet P–4, Safe Handling of Cylinders by Emergency Rescue Squads.
(9) Handbook of Compressed Gas and 29 CFR 1910.101–105.

b. Codes, standards, and pamphlets are available from NFPA, Publications Service Department, 60 Battery March Street, Boston, MA 02110, or the Compressed Gas Association Inc., 500 Fifth Avenue, New York, NY 10036. A nominal fee is charged for each publication ordered.

Figure 5–8. Example of compressed gas storage

c. Medical gas and vacuum systems will be maintained, tested, and inspected according to NFPA 99, chapter 5. Key requirements that should be periodically checked are as follows:

(1) Doors or gates to enclosures for the gas supply systems will be locked.

(2) Enclosures for gas supply systems will not be used for storage purposes other than for cylinders containing the nonflammable gases which are to be distributed through the pipeline.

(3) Storage of empty cylinders disconnected from the supply equipment is permissible.

(4) Empty cylinders will be segregated and identified.

(5) Cylinders not in use will be capped and secured in a vertical position by a chain or similar device.

(6) Cylinders connected to a manifold will also be secured. Plumbing (tubing and so forth) to the manifold will not suffice for this purpose.

(7) Smoking is prohibited in the gas supply system enclosure. "No Smoking" signs will be posted.

d. Operating and emergency alarm systems and pressure gauges will be utilized to facilitate continuous surveillance.

(1) Each signal gauge will be appropriately labeled.

(2) Local operating instructions will be written regarding actions required upon activation of these alarms.

e. The gas content of pipelines will be readily identifiable by appropriate labeling with the name of the gas contained (see fig 5–9). Labels will appear on exposed pipe at intervals not less than 20 feet and at least once in each room and story traversed by the pipeline.

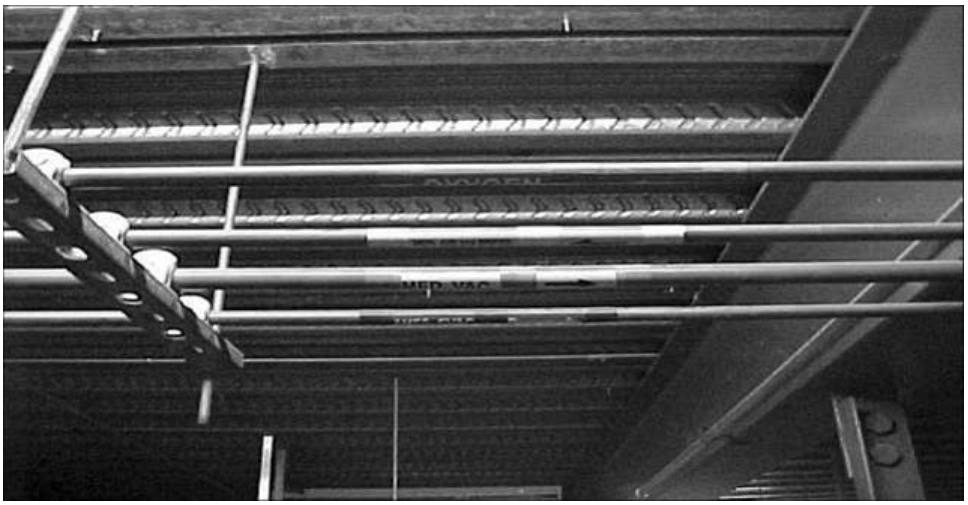

Figure 5–9. Example of marked pipelines

f. A pressure relief valve set at 50 percent above normal pipeline pressure must be located downstream of the pressure regulating valve and ahead of any shut-off valves in the oxygen system.

g. Piping systems for gases will not be used as grounding point.

h. Shut-off valves accessible to other than authorized personnel will be labeled: "CAUTION (NAME OF MEDICAL GAS) DO NOT CLOSE EXCEPT IN EMERGENCY; THIS VALVE CONTROLS SUPPLY TO_____."

i. Disaster plans will address operation of oxygen shut-off valves.

j. Medical gas systems will be equipped with manually operated zone shut-off valves labeled with the name of the gas according to NFPA 99, chapter 5.

k. All pressure gauges, including gauges applied temporarily for testing purposes and manometer for oxygen will be those manufactured expressly for the gas oxygen and labeled: "OXYGEN—-USE NO OIL."

5–7. Autoclaves and sterilizers

Steam autoclaves and sterilizers (see fig 5–10) may be found in various locations within a medical facility. The following safety rules are applicable:

a. Preventive maintenance schedules will be in accordance with manufacturer's schedules/specifications.

b. Safety relief valves and sealing gaskets will be maintained in good condition.

c. Sterilizers will not be opened until steam pressure has dropped to zero. Steam pressure will never be used to blow open a stuck door.

d. Use of autoclaves will be restricted to trained personnel.

e. All autoclaves, sterilizers, and glass-washers (as well as any other major electrical equipment item) will have a main power shut-off switch or breaker switch located near the unit so personnel can quickly shut off power in case of an emergency or malfunction.

f. Ethylene oxide sterilizers present both toxic and fire hazards and will be operated only by personnel trained in their use.

(1) Personnel using these aeration cabinets will be thoroughly familiar with recommended minimum aeration time for various materials in accordance with manufacturer's instructions in order to reduce residual ethylene oxide contamination.

(2) A copy of the manufacturer's recommended aeration time schedule will be maintained in the immediate area of the sterilizer.

(3) When sterilizers use ethylene oxide and aerators, exhaust of ethylene oxide will be vented to the exterior of the building. Venting of these units to the interior of the building (for example, into a moistened sponge) is unacceptable.

Figure 5–10. Example of sterilizer

(4) Ethylene oxide sterilizers will be located in a way that minimizes the length of exterior vent lines.

(a) In no case will vent lines deviate from the manufacturers' recommended specifications for vent diameter, length, vertical rise, or material.

(b) A guide outlining general techniques applicable to all hospital ethylene oxide systems, "Comprehensive guide to steam sterilization and sterility assurance in health care facilities" is available from the Association for the Advancement of Medical Instrumentation (AAMI), 1110 N. Glebe Rd. Suite 220, Arlington, VA 22201–4795, or the AAMI Web site at http://www.aami.org.

Chapter 6
Laboratory

6–1. Personnel practices

a. Eating, drinking, chewing gum, smoking, and the application of cosmetics within the laboratory are prohibited.

b. Pipetting of infectious, toxic, or corrosive fluids by mouth is prohibited.

c. Personnel will avoid hand-to-face motions when working with infectious or toxic materials.

d. Wrist jewelry, watches, and rings will not be worn when infectious materials are handled.

e. Contact lenses will not be worn without the use of appropriate safety eye ware when eye hazards exist in the laboratory in accordance with DA Pam 385–30 and Department of Defense Instruction (DODI) 6055.2.

f. Foods will not be stored in laboratory refrigerators.

6–2. Procedures and equipment

a. Work with flammable or toxic materials will be conducted in exhaust ventilation hoods (see fig 6–1).

(1) The nature of the work being done will determine the type of hood required (see the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Web site at http://www.ashrae.org for information on general techniques of HVAC Applications applicable to hospital systems).

(2) In general, the hood exhaust system will operate independently of the general ventilation system and have its own air supply.

(3) In general, exhaust hoods should be located away from doors and windows in areas of minimum air turbulence.

Figure 6–1. Example of laboratory hood

(4) Glazing shall be of a material that will provide protection to the operator or environment against the hazards normally associated with the use of the hood.

(5) Hoods will be designed to prevent backflow of contaminants into the room (see AR 40–5).

(6) Shut-off valves for services, including gas, air, vacuum, and electricity will be located outside the hood enclosure (see fig 6–2).

b. Work with infectious organisms will be conducted utilizing an appropriate biological safety cabinet (BSC) as the primary means of containment.

(1) Exhaust from BSCs in which infectious materials are processed will pass through high-efficiency particulate air (HEPA) filters (99.9 percent at 0.3 microns) before discharging to the atmosphere.

(2) The HEPA filters will be changed only by trained personnel. The general classification and requirements for biological safety cabinets are contained in National Sanitation Foundation (NSF) Standard 49, "Class II (Laminar Flow) Biosafety Cabinetry," and the CDC/NIH, "Primary Containment for Biohazards: Selection, Installation and use of Biological Safety Cabinets."

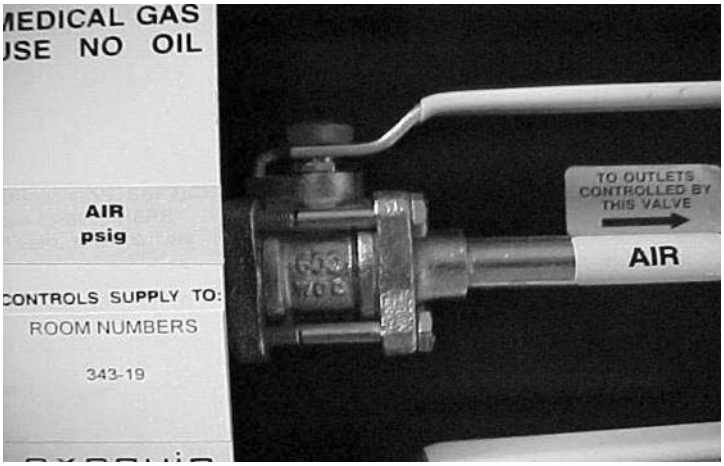

Figure 6–2. Example of hood cutoff valve

6–3. Eye washes and emergency showers

Eye washes and emergency showers or equivalent devices will be located within the laboratory convenient to work stations that utilize corrosive liquids, acids, and so forth (see fig 6–3).

a. Floor drains should be provided in the area.

b. Electrical devices should not be located near the drainage area in order to prevent an electrical shock hazard to anyone using the shower (ANSI Z358.1, "Emergency Eye Wash and Shower Equipment").

Figure 6–3. Example of emergency eye wash

6–4. Supplies of hazardous chemicals

a. Supplies of hazardous chemicals within the laboratory will be kept to a minimum.

b. A 7-day supply or the smallest unit stock listed container is considered reasonable.

c. All containers will be clearly labeled.

d. Hazardous chemicals will be separated from nonhazardous materials.

e. Care will be taken to segregate chemicals that react violently when mixed together such as the following:

(1) Ammonia and mercury.

(2) Chromic acid and certain organic.

(3) Nitric acid and aniline organic.

(4) Chlorine and ammonia, hydrogen, metal powders.

(5) Oxidizers with most metal powders, flammable liquids.

(6) Alkali metals and water.

f. Storage of flammable or combustible liquids will be kept to a minimum and comply with the requirements of NFPA 30, 45, and 99.

(1) Not more than 10 gallons or 7-day supply (whichever is less) of flammable and/or combustible liquids (aggregate capacity) will be maintained outside of storage cabinets within the laboratory.

(2) If laboratory activities require more than 10 gallons or 7-day supply to be present, the excess will be stored in an approved flammable storage cabinet.

(3) These liquids will be obtained or procured from, and stored in, the manufacturers original container or an approved and properly labeled safety can.

g. Laboratory storage areas for small quantities of these liquids will be ventilated and kept away from all heat sources.

h. Flammable liquids will not be stored in refrigerators.

i. If refrigeration is necessary to control reaction rates or other similar operations, and no convenient alternative exists, storage of liquids in well-sealed containers is permissible in explosion-proof refrigerators. Each refrigerator will be labeled on the outside of its door to denote whether or not they are safe for storage of flammables.

j. Use of flammable gases in conjunction with laboratory equipment such as flame photometers will be in accordance with NFPA Standard 99, chapter 11.

6–5. Centrifuges

Centrifuges will be covered when operated.

a. Centrifuge tubes will fit the metal buckets and will not have defects or cracks.

b. Cushions at the bottom of the cups should be in good condition.

c. An inspection and maintenance schedule will be established for centrifuges and associated equipment installed in the laboratory.

6–6. Microtome

Microtome will not be left unattended with blades in place.

a. When not in use, blades will be stored in appropriate containers.

b. When in use, exposed blades edges other than the actual cutting surface will be guarded.

c. Simple guards can be locally constructed from segments of rubber tubing slit lengthwise.

6–7. Temperature shut-off controls

All electrical heating equipment will be equipped with over-temperature shut-off controls.

6–8. Handling of hot items

Thermal gloves, beaker and crucible tongs, and test tube holders will be available for handling hot items.

6–9. Handling of sodium azide

Precautions will be taken with sodium azide which is a common preservative in many in-vitro diagnostic products.

a. Sodium azide poured into drains reacts with metal in the plumbing and forms a powerful contact-sensitive explosive.

b. Decontamination procedures for azide-contaminated plumbing have been published in "Manual Guide—Safety Management No. CDC–22, Decontamination of Laboratory Sink Drains to Remove Azide Salts," dated April 30, 1976 by CDC, Atlanta, Georgia (This manual is available at http://cdc.gov.).

6–10. Chemical safety

Laboratories will comply with the requirements of NFPA 99, chapter 10, and TM 38–410.

Chapter 7
Hospital Hazards

7–1. Kitchen

The employees of the hospital dining facility have one of the highest injury rates in the facility. The kitchen is considered a high interest area and should be on a quarterly high interest inspection schedule (see fig 7–1).

a. Slips and falls are prevalent in the industrial kitchen environment. It is very important for staff to be attentive and clean up spills promptly.

b. Heavy lifting is common in the hospital kitchen.

c. Safety footwear is a must; the potential is always present that something may be dropped.

d. Heat, cold, sharp knifes, cutting tools, cylinders, and chemicals also add to the hazards found in the kitchen and surrounding areas.

e. Staff working in the kitchen must be trained on hazard recognition and how to report hazards.

f. When workers change job assignment to another part of the kitchen they must be trained to recognize the hazards associated with this new job assignment.

g. Ensure a job safety analysis (JSA) is performed for each employee. Supervisors should conduct an annual review of the JSA and make the appropriate adjustment to ensure a safe environment for their employees.

Figure 7–1. Example of hospital kitchen

7–2. Operating suites - Surgery

Operating suites are locations that employ inhalation anesthetics (see fig 7–2). Use of inhalation anesthetics will conform to standards in NFPA 99, chapter 3, Use of Inhalation Anesthetics (Flammable and Nonflammable). Key requirements checked on a regular basis will include, but are not limited to, the following:

a. The relative humidity in anesthetizing locations will be maintained above 50 percent. Humidity measuring and recording instruments are installed in areas where anesthesia is routinely used.

b. An isolated electrical power supply will be provided for each flammable anesthetizing location.

(1) The system will include either a line isolation monitor (dynamic detector-required for new facilities) or a ground detection alarm (static detector-permitted by NFPA in older existing facilities).

(2) Whichever detector is used, it will be tested according to National Electrical Code (NEC) Article 517 by medical maintenance personnel, and a record of these tests will be maintained.

c. Conductive flooring will be provided for each flammable anesthetizing location and will be tested according to Air Force Manual (AFMAN) 23–110V5. If conductive flooring is installed in nonflammable locations, it will also be tested according to the referenced manual.

Figure 7–2. Example of operating suite

d. Conductive footwear will be worn in flammable anesthetizing locations. Resistance of the footwear will not exceed 500,000 ohms.

e. In flammable or mixed anesthetizing locations, the following materials will not be permitted for outer garments or for non-apparel purposes, unless such materials have been tested and found anti-static:

(1) Silk.

(2) Wool.

(3) Synthetic textile materials.

(4) Blends of synthetic textile materials.

(5) Blends of synthetic textile materials with unmodified cotton or rayon.

(6) Non-woven materials.

f. Portable electrical equipment, such as incubators, X-ray machines, and so forth, used in flammable anesthetizing locations will be "explosion-proof" according to NFPA.

g. Casters on portable conductive equipment will be kept clean and free of wax or other foreign matter.

h. Furniture used in flammable anesthetizing locations will be constructed of electrically conductive material and will be outfitted with conductive wheels, pads, or other conductive floor contact devices.

i. Surfaces should not be painted.

j. Only noncombustible agents will be used for anesthesia or for pre-operative preparation of the surgical field if electrocautery, electric coagulation, or any other electrical equipment employing an open spark is to be used during the operation.

k. Anesthesia equipment should not be covered. Covers may confine small leaks, producing an explosive or flammable atmosphere that could ignite when the cover is removed.

l. Patient electrodes (ground plate) of Radiofrequency (RF) electro-surgical units will be kept free of corrosion and irregular surfaces.

(1) Reusable (non-disposable) patient electrodes should be permanently connected to the patient return cable without the use of clips or clamps.

(2) Disposable patient electrode plates and adhesive electrodes are exempt from this requirement when used with reusable (non-disposable) patient cables.

m. Lint removal pads may be placed at each entrance to the surgical suite. These pads will be replaced frequently.

n. Only ventilators which have a low-pressure alarm system will be used. Periodic maintenance leakage testing will be accomplished as prescribed by the manufacturer.

7–3. Operating room suites quarterly inspections

a. Quarterly hospital inspections are mandated for operating room (OR) suites since compressed gas cylinders, patient movement from one gurney to the OR table (lifting hazard) (see fig 7–3), anesthesia drugs hazards, formaldehyde, glutaraldehyde, waste anesthesia gas (WAG), waste anesthesia gas evacuation (WAGE), extension cords, electrical hazards, wet locations, and ethylene oxide (ETO) gas all present their unique hazards associated with the OR environment.

Figure 7–3. Example of operating table

b. Fires in ORs are not uncommon. Quarterly fire drills will be conducted for all personnel on all shifts; the staff, not the patients or visitors, should participate in the fire drill. Conducting fire drills without disrupting patient care activities must be considered.

c. NFPA publication, "Fire Safety in Healthcare Facilities" is recommended to assist hospital safety managers with fire safety programs.

d. Oxygen can be trapped under the drapes and increase the potential for fire ignited from the laser or electrical surgical unit (ESU) when the surgeon starts the procedure. Ample references are available on this subject.

e. Hazard recognition is an important part of the overall hospital safety program. Documentation of the quarterly, high-interest-area safety inspections or semiannual safety inspections, hazard surveillance or environmental rounds is very important for JCAHO inspections.

f. The key to remember is patient safety. The staff and visitor's safety is important as each hospital strides to provide a safe, supportive, functional environment for patient, staff, and visitors.

7–4. Central material supply

Central material supply (CMS) is there to support OR operations. It ensures the needed supplies are available for the staff to use when needed (see fig 7–4).

a. Hazards in the CMS might include chemical, ETO, falls, biological, needle sticks, and back injuries.

b. Most hospitals are substituting a less hazardous substance for ETO.

c. Consider including the CMS area as a high-interest area in the spot inspection program. It is a location that deserves some close looks to ensure optimum safety.

d. In addition to the obvious healthcare hazards, survey the area to ensure—

(1) The rooms are well lighted.

(2) Exits and aisles are clear at all times.

(3) Rubbish, empty cartons, and paper are disposed of immediately; and heavy items are always stored on the lower shelves.

(4) Spillage items are stored on the lower shelves.

(5) Flammable liquids are stored in approved containers.

(6) Employees are lifting correctly.

(7) Fire extinguishers are located in the proper place, checked monthly, maintained appropriately, and properly documented. Of course, these are only a few of the checklist items one must check when doing environmental rounds in the CMS area.

Figure 7–4. Example of central supply

7–5. Radiation

a. General concepts.

(1) Ionizing and non-ionizing radiation are normally encountered in hospitals, health, dental, and veterinary activities and pose potential risks that must be managed.

(2) To minimize their inherent risks, radiation-producing systems must be used by well-trained personnel and undergo regular inspection, maintenance, and calibration.

(3) In general, the radiation safety program is based on controlling radiation sources to ensure that they are used as intended. This includes control of personnel who work with or are exposed to radiation sources, those who monitor exposures, educate the work force, measure and document radiation emissions, and those who conduct medical surveillance for early detection/remedies for overexposures.

(4) A trained and qualified Radiation Safety Officer (RSO), a written program document, and use of personal protective equipment are some of the more salient elements of healthcare activity radiation protection programs. Complex programs may also require oversight by a radiation safety committee. Useful references pertaining to radiation safety are AR 385–10, DA Pam 385–24, DA Pam 40–18, DLAR1000.28, TB Med 521, TB MED 523, TB MED 524, TB MED 525, and USAEHA TG No. 153.

(5) All radiation sources in the hospital should be catalogued on an inventory.

b. Nuclear medicine.

(1) Hospitals that provide nuclear medicine services are licensed by the U.S. Nuclear Regulatory Commission and possess varying amounts of radioactive material.

(2) Hazards in nuclear medicine include radiation exposure and radioactive contamination.

(3) Nuclear medicine workers generally require personnel dosimetry (thermoluminescent dosimeter (TLD) badges), and initial and annual radiation safety training.

(4) Personal protective equipment includes lab coats, latex gloves, and syringe shields, and, where necessary, dedicated exhaust hoods for handling dispersible radioactive material.

(5) Nuclear medicine clinics are routinely checked for radiation and contamination by the RSO.

(6) Nuclear medicine clinics generate radioactive waste which must be controlled and managed for disposal.

(7) Facility design for nuclear medicine clinics may include lead shielding in walls and doors. Any new construction or modification of nuclear medicine facilities requires a review by a qualified expert in accordance with TB Med 521.

c. Radiology.

(1) Radiology departments are equipped with x-ray generating systems that create potential radiation hazards for workers, patients, and the public (see fig 7–5).

(2) X-ray systems are routinely inspected for compliance with safety requirements by qualified experts in accordance with TB Med 521. These inspections are generally referred to as “x-ray surveys.” Other routine inspections are performed by medical maintenance personnel.

(3) X-ray workers require initial and annual radiation safety training, and may require personnel dosimetry (TLD badges), as determined by the RSO.

(4) Personal protective equipment includes protective lead aprons and gloves, and in some cases, thyroid shields and

leaded eye ware. Leaded aprons and gloves will be in good condition. Racks will be provided to hang aprons when not in use. Aprons must not be folded because sharp creases result in cracks, lessening the integrity of the protective shield.

(5) Good housekeeping is essential since a considerable amount of work is accomplished under low levels of illumination.

(6) Portable x-ray equipment will be stored to prevent unauthorized use. A leaded apron for the operator should be kept with the machine. When the machine is transported, the tube head should be in a lowered and locked position.

(7) Facility design for radiology clinics may include lead shielding in walls and doors. Any new construction or modification of x-ray facilities requires a review by a qualified expert in accordance with TB Med 521.

Figure 7–5. Example of radiology

d. Magnetic Resonance Imaging.

(1) Staff must always remember that the magnet is continuously on (see fig 7–6). All staff must follow the direction of magnetic resonance imaging (MRI) personnel to ensure patient handling is done safely and according to established protocol. There have been instances of items such as buffer, beds, and oxygen cylinders being drawn into the magnet.

(2) Never cross the red line without being escorted by a MRI staff member (see fig 7–7).

(3) Remove all metal objects before proceeding past the red line.

(4) Follow written instruction posted and always follow the direction of MRI staff (see fig 7–8).

(5) Use only the gurneys and wheelchairs provided by the MRI staff.

Figure 7–6. Example of "Magnet Always On" warning sign

Figure 7–7. Example of MRI redline

Figure 7–8. Example of MRI safety directions

e. Lasers.

(1) Lasers are used throughout the hospital. The principal hazards associated with hospital laser systems include eye injury, skin injury, and fire.

(2) Hospital laser use requires a trained and qualified Laser Safety Officer (LSO), and a written laser safety program.

(3) Laser operators require initial and annual training and baseline eye exams.

(4) Laser personal protective equipment includes eye ware that is specific to the wavelength of the laser light.

(5) Laser systems will be inspected annually by the LSO.

7–6. Emergency room

The emergency room (ER) is a very busy place and hazards are abundant (see fig 7–9). It gets very crowded in and around the ER with doctors, nurses, and others when patients are being treated.

a. Hazards include trips, slips, and falls; strains from staff moving patients; x-rays taken in close vicinity of other patients, visitors, and staff.

b. Before X-ray technicians take an X-ray, they must call "clear" to ensure those around them are aware of the danger and others are warned to take the appropriate protective measures to ensure they are not exposed.

c. Another major concern in the ER is an assault on a staff member, another patient, or a visitor.

d. Most hospitals have their own security and procedures in place to limit or mitigate assaults.

(1) Staff must know the procedures for handling agitated patients, visitors, and staff.

(2) Staff must know what to do and how to report these incidents.

Figure 7–9. Example of emergency room

e. Most ERs are considered suites and sometimes it is hard to determine just where the egress routes are located. However, there must be clear and unobstructed egress from the ER. The safety manager must work closely with the ER staff in following the requirements of NFPA 101 on keeping these passageways clear.

f. When conducting quarterly fire drills (required for all personnel on all shifts), the staff will simulate patient movement by moving a gurney to the designated area of refuge or the location the ER staff will move patients to, if required to evacuate.

g. The primary purpose of the fire drills is to evaluate the staff, with no disruption to patient care.

Chapter 8
Hazard Recognition

8–1. Hazards

Some hazards are unique to healthcare/hospital environments, demonstrated by the many different locations mentioned above, in which healthcare activities take place. This in combination with very different scenarios depending on the location presents many hazards not normally found in the common workplace. Specialized hazard recognition for these environments is important to ensure optimum safety of our patients as well as our visitors and staff.

a. A patient's exposure to unique, unfamiliar hazards commonly found in healthcare environments is one of the more critical scenarios. Typically, the patient is debilitated somewhat and unable to respond to hazards as would a healthy worker or visitor.

b. Another scenario is exposure of healthy personnel (visitors or workers) to hazards commonly encountered in healthcare environments. This scenario has separate concerns as well.

c. With the visitor, like the patient, there is an element of unfamiliarity with hazards unique to the healthcare

environment. For example, a patient or a visitor (especially if the patient is a child) may tamper with equipment or stick things in the electrical outlets. That is one reason that hospitals must have tamper-resistant receptacles in all areas where children are treated.

d. Alternatively, the patient/visitor may introduce normally harmless items into the healthcare environment that could cause very serious risks. Items like a hair dryer or a cell phone brought into the healthcare environment could induce electrical interference in critical life support equipment, cause a fire in oxygen enriched atmosphere or contaminate a sterile environment which could lead to nosocomial infections. Medical maintenance must check all electrical items that are present in a patient care area.

e. Some hospital safety managers will check personal electrical appliances that a patient might bring into the hospital, but medical maintenance will not. NFPA 99 gives the inspection guidance for electrical checks.

8–2. Healthcare risks

Army healthcare activities involve many different risks. These risks are also commonly encountered in civilian hospitals and other non-Army healthcare delivery activities. All federal standards prescribed by OSHA, the Nuclear Regulatory Commission (NRC), the Federal Aviation Administration (FAA), and CDC pertaining to healthcare activities are applicable. Also, nongovernmental criteria from the JCAHO, the NFPA, and the College of American Pathology (CAP), as well as safety criteria found in other national consensus standards are applicable to all Army healthcare delivery activities.

8–3. Joint Commission on Accreditation of Healthcare Organizations

All MTF must comply with the JCAHO standards.

a. Normally the safety manager is the coordinator for JCAHO's management of the Environment of Care (EC). All MTF safety offices must have the JCAHO publication "Environment of Care Essentials for Healthcare." This publication will provide a checklist of all the EC standards and can be ordered through JCAHO. It is a step by step process for compliance.

b. There are seven EC elements: safety, security, emergency management, medical equipment management, fire protection, hazardous material/waste, and utilities management. Normally the safety manager has responsibility for three of the elements: safety management, fire protection, and hazardous material/waste.

c. A management plan for all seven elements must be developed as well as a written annual evaluation of the management plan/program.

(1) The safety manager will consolidate these annual evaluations from the point of contacts (POCs) of the other elements and forward the annual evaluations to the governing body.

(2) At least one performance improvement measure (PIM) from the seven elements must be forwarded for consideration to the governing body.

(3) In essence, each person that is responsible for one of the elements provides a PIM to the safety committee (sometimes called the environment of care committee (EOCC)). The committee selects one PIM that will go forward.

8–4. Care core processes

The core processes in the environment of care are—

a. Design.
b. Documentation.
c. Staff development.
d. Risk assessment.
e. Emergency response.
f. Inspections, testing, and maintenance.
g. Information collection for system evaluation (ICSE).
h. Performance monitoring.
i. Annual evaluation.
j. Performance improvement.
k. All seven EC elements must have safety management plans.

(1) The safety management plan is typically a comprehensive document describing all safety and occupational health (SOH) aspects of the environment of care in the healthcare setting. The primary focus is on patient's safety; taking into account the diminished ability of patients to anticipate or respond to risks as well as the unusual nature of the risks commonly encountered in healthcare environments.

(2) The safety management plan generally provides SOH processes for the following:

(a) Maintaining and supervising all grounds and equipment.

(b) Conducting risk assessment that proactively evaluates the impact of buildings, grounds, equipment, occupants, and internal physical systems (especially electrical, water, and HVAC) on patient and public safety.

(c) Examining safety issues by appropriate representatives from administration, clinical services, and support services.

(d) Reporting and investigating all incidents of property damage, occupational illness, and patient, personnel, or visitor injury.

(e) Ongoing surveillance, including response to product safety recalls.

Chapter 9
Safety and Occupational Health Advisory Committee

9–1. Organization safety program

The Commander of medical centers, hospitals, and separate (stand alone) clinics uses a multidisciplinary safety and occupational health advisory committee (SOHAC) to develop, implement, and monitor the organization safety program.

a. If the MTF commander elects to have an Environment of Care Committee instead of a Safety and Occupational Health Advisory Committee; then the MTF will have a separate SOHAC or the safety manager will be an active member of the host installation safety committee.

b. The SOH/EOC committee will be chaired by the Hospital Chief of Staff/Deputy Chief for Administration.

9–2. Recorder

The qualified safety manager will be a member of the committee and will act as the recorder.

9–3. Meeting schedule

The Safety and Occupation Health Advisory Committee/EOCC will meet at least bimonthly.

9–4. Minutes

The committee will maintain written minutes of each meeting.

a. The minutes, including pertinent findings and recommendations of the committee, will be forwarded to the Executive Committee and the Commander for approval.

b. Copies of the approved minutes will be furnished to all major division chiefs, committee members, the Regional Safety Director, and the USAMEDCOM Safety Office.

9–5. Qualified safety and occupational health manager

Qualified safety persons are civilian personnel who are qualified under the Office of Personnel Management (OPM) General Schedule (GS) 018 Series. These personnel are the agents for the hospital commander on all safety related issues.

Chapter 10
Fire Safety

10–1. Fire prevention/protection

Fire prevention/protection is a critical healthcare safety program element. This is due to several factors relatively unique to healthcare activities.

a. Partially or completely non-ambulatory patients require assistance to relocate away from a fire. In addition, patients and visitors may not be familiar with their surroundings, the fire alarm systems, or fire evacuation procedures. Some patients, though ambulatory, may be disoriented due to their medication.

b. The use of pure oxygen and other flammable chemicals common in healthcare facilities only adds to and increases the complexity of fire safety risks in healthcare settings.

c. Because of these factors, healthcare safety managers must be especially knowledgeable of all fire protection codes that pertain to the healthcare setting. Overseeing or providing fire safety training, inspections, policy, standard operating procedures, and drills are all very typical actions performed by healthcare safety managers.

d. The MTF/activity safety manager is also the facility fire marshal and should be very familiar with NFPA 101 and other appropriate fire codes and standards.

10–2. Physically or mentally disabled individuals

Individuals who are physically or mentally disabled must receive the highest degree of fire protection practical; therefore, fire prevention programs in health care facilities will receive continual emphasis for optimum protection.

a. The safety manager/fire marshal will ensure that fire drills (code red drills) are conducted on all shifts for all personnel.

b. All fire drills will be documented.

(1) The Joint Commission on Accreditation of Healthcare Organizations requires documentation of drills.

(2) If training deficiencies exist, on-the-spot training of personnel is required to ensure optimum response to fire emergencies.

10–3. Basic fire prevention and protection standards

The basic fire prevention and protection standards for fire receptivity and/or protection of buildings occupied by patients are outlined in NFPA 101.

a. Additional guidance provided in the JCAHO Accreditation Manual for Hospitals should be followed. Each facility will be surveyed for compliance with these standards by a qualified safety/fire inspector.

b. The safety manager shall ensure that these environment rounds are being conducted. These surveys (semiannual and quarterly high interest) are in addition to the annual inspections required by AR 385–10 and will be updated with each change or addition to the facility.

c. A record of these surveys will be maintained and any uncollected deficiencies monitored per instructions contained in AR 385–10 and PAM 385–30.

d. All medical personnel will know the location of fire extinguishers in their work area and how to operate them. Personnel are required to have annual fire extinguisher training.

e. Four general classifications of fires have been adopted by the NFPA. The classifications are—

(1) *Class A.* Fire involving ordinary combustible materials such as wood, paper, cardboard, plastics, and so forth.

(2) *Class B.* Fire involving flammable or combustible liquids such as gasoline, kerosene oil, and common organic solvents used in the laboratory, and so forth.

(3) *Class C.* Fire involving electrical equipment; basically, an electric fire.

(4) *Class D.* Fire involving combustible metals such as, Sodium, magnesium, titanium, potassium, uranium, and so forth.

f. Each fire extinguisher will be labeled to indicate the class of fire(s) for which it can be used.

(1) Using the wrong type of fire extinguisher may not only fail to put out the fire but may actually cause it to spread.

(2) Using water on an electric (Class C) fire could result in electrocution of the operator.

(3) A joint survey of the medical facility by a qualified fire inspector and the medical facility safety representative will be conducted to ensure that the type and quantity of fire extinguishers needed for different classes of fires are grouped properly and each extinguisher is marked to identify its intended use.

(4) Extinguishers will not be obstructed or hidden from view.

(5) Extinguisher locations will be clearly identified.

(6) Fire extinguisher will be inspected at least monthly and included in a regular maintenance program.

g. Written regulations governing smoking will be published by each medical facility, and will comply with standards published in the JCAHO Accreditation Manual, Department of Defense Instruction (DODI) 1010.15, and AR 600–63.

10–4. A statement of conditions

A Statement of Conditions (SOC) document describes the level of compliance of an organization's facilities (focusing on the physical plant) with NFPA's Life Safety Code.

a. The Joint Commission on Accreditation of Healthcare Organizations requires a SOC that covers all healthcare facilities (except dental and veterinary).

b. The Joint Commission on Accreditation of Healthcare Organizations views a SOC as a tool for continuously identifying, assessing, and resolving life safety code (LSC) deficiencies.

c. The MTF safety manager will work with the facility management branch in preparation of a SOC. United States Army Center for Health Promotion and Preventive Medicine (USACHPPM) personnel will come to the MTF and complete a SOC when requested.

d. The safety manager will ensure that any deficiencies are tracked through the use of a violation inventory log, and a hazard abatement plan (HAP) must be completed, as appropriate for any item that requires a part 3 or 4 (plan for improvement) of the SOC.

10–5. Improvement plan

A plan for improvement with measurable outcomes plus, evaluating SOH performance over time, is an integral component of an effective performance-improvement program required by the JCAHO.

a. A plan for improvement involves assessing patterns and trends and comparing recent performance with past performance (self-comparison) and with that of other organizations.

b. Using indicators that are a part of a performance measurement system, and that are thus shared by many

organizations can yield the kind of information needed to compare the SOH program of a healthcare delivery activity with that of others. Often these indicators serve as a catalyst for change and an improved SOH program. They are a starting point for assessment.

c. Typically, assessment is intensified when one or more of the following occur:

(1) A sentinel event—an unexpected occurrence or variation involving patient care, resulting in death, serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The event is called "sentinel" because it should send a signal or sound a warning that requires immediate attention.

(2) Certain levels, patterns, or trends emerge where performance is undesirable and varies significantly from expected performance or performance shows a trend toward an undesirable rate.

(3) Performance is undesirable and varies significantly from that of other similar organizations or activities.

(4) An organization wishes to improve currently acceptable or even superior performance even though its current rate exceeds professional standards and the aggregate performance rate of all other healthcare delivery activities participating in the performance measurement system.

10–6. Disaster drills

The emergency preparedness plan is executed twice a year, in response either to a "real" emergency or in a scheduled drill.

a. Organizations that offer emergency services or are designated as disaster receiving stations must perform at least one exercise yearly that includes an influx of volunteer or simulated patients.

b. Exercises are conducted no less than least four months apart and no more than eight months apart.

c. Safety and occupational health risk assessments of all aspects of each drill are required.

10–7. Maintenance plans

Strict programs for maintenance of critical life support equipment and systems will be implemented. The following documentation is required:

a. A current, accurate, and separate inventory of all equipment in the medical equipment management program, regardless of ownership.

b. Performance and safety testing of all equipment in the management program prior to initial use and at least annually thereafter.

c. Preventive maintenance and inspection of medical equipment according to a schedule based on current organizational experience and ongoing monitoring and evaluation.

d. Annual chemical testing and monthly biological testing of water used in chronic renal dialysis.

e. Performance testing of all sterilizers used.

10–8. Periodic inspections and evaluations

Hazard surveillance surveys will be performed (usually by the safety manager) every six months and in non-patient care areas at least annually to identify environmental deficiencies, hazards, and unsafe practices. A summary report of findings and status of improvement projects is provided to the safety committee.

10–9. Training

Continuing education programs typically include topics on bloodborne pathogens, chemical hygiene, confined space, lockout/tagout, hazard communication, fire prevention, respiratory protection, ergonomics, and prevention of exposure to tuberculosis, safe handling of compressed gases, internal and external disasters, sanitation, prevention of sharps, back injuries, and other SOH subjects.

a. A safety orientation program must be provided for all new employees (Soldiers and civilian) and training should be documented. Typically, training is based on a supervisor's job hazard analysis and developed by supervisors for specific areas and activities within the healthcare setting. In addition to the supervisors, safety managers play a major role in directing, orchestrating, evaluating, consulting on, developing, and sometimes conducting such training.

b. Safety specialists working in healthcare activities must coordinate frequently and closely with available experts, including, but not limited to industrial hygienists, occupational health nurses, occupational health physicians, health physicists, infection control nurses, environmental science officers, physical therapists (back injury prevention), fire inspectors, radiation protection officers, risk management/quality assurance officers, security officers and other personnel as deemed appropriate.

10–10. Other specific health care hazards

Statistics from the National Safety Council and the Bureau of Labor Statistics indicate the healthcare delivery industry is among the top ten high risk industries. Hazards include, but are not limited to—

a. Pathogens. Potential exposure to pathogens is a normal condition of all healthcare environments. Such exposures typically occur in emergency rooms, clinics, operating suites, exam rooms, or patient rooms.

(1) Anytime exposure to a patient's body fluids is possible, universal precautions prescribed by the Center for

Disease Control will be indicated. Universal precautions include, but are not limited to, wearing protective gloves, aprons, and eye wear, as well as hand washing.

(2) Airborne pathogens are also a concern. Tuberculosis is one of the better known airborne pathogens.

(3) Infectious waste, soiled linen, and laboratory cultures/specimens are also areas of concern for potential exposure to pathogens.

b. Chemicals. Many hazardous chemicals are present in healthcare delivery activities. All pharmaceuticals are potentially hazardous. By definition, all are biologically active agents which, when properly administered, aid in healthcare. However, when unintentional or over exposure to pharmaceuticals occurs, health is at risk.

(1) Antineoplastics, although of therapeutic value to patients, have mutagenic, carcinogenic and teratogenic potential. Healthcare personnel, such as pharmacists, physicians, nurses, and others handling these drugs have been shown to be potentially at risk. Added to pharmaceuticals are a large number of other potentially deadly chemicals.

(2) Ethylene oxide, formaldehyde, hydrogen peroxide, and other highly toxic chemicals are sometimes used as disinfectants in the operating room CMS and other areas.

(3) Liquid nitrogen is used to freeze tissue in some clinics.

(4) Pure oxygen used on pediatric wards and in other areas is integral to respiratory therapy. However, pure oxygen can pose an extreme fire hazard.

(5) Anesthetic gases used in operating suites, although, today, typically free of the explosive and flammable hazards, they still have inherent hazards to both the patients and staff in terms of over exposure. Specifically, over exposure can result in drowsiness on the part of the staff and can lead to deadly medical errors. Alternatively, overexposure can cause cancer. Overexposing a patient to anesthetic gases can be equally deadly.

(6) Hazards are linked to the heavy metals typically used in dentistry. Toxic metal fumes are commonly associated with welding in hospital brace shops and medical maintenance shops.

(7) Finally, a very wide range of hazardous chemicals is concentrated in hospital laboratories.

10–11. Musculoskeletal injuries

According to the National Institute for Occupational Safety and Health (NIOSH), healthcare industry workers have the greatest prevalence of musculoskeletal injuries. This is not surprising given the requirements of lifting, pulling, sliding, turning, and transferring of patients, moving of equipment, and standing for long hours.

a. Medical staff moving patients that are incapacitated or otherwise non-ambulatory to or from beds is perhaps the largest contributor to back injuries in the healthcare industry. Musculoskeletal injury risks are also high in hospital food service preparation areas, medical warehouse operations, and in healthcare related clerical activities.

b. A written ergonomics program to address musculoskeletal risks is required. Six critical elements for ergonomic intervention are: workplace analysis, prevention and control, healthcare management, education/training, evaluation/review and acquisition.

c. The Army Surgeon General (TSG) is the Army proponent for ergonomics. The United States Army Center for Health Promotion and Preventive Medicine manages the program for TSG and provides assistance. Useful references for this program include DODI 6055.1, and NIOSH Elements of Ergonomics (http://www.cdc.gov/niosh/docs/97–117).

10–12. Emergency vehicle

Healthcare activities frequently operate emergency vehicles utilizing siren and emergency lights.

a. To adequately manage inherent risks, emergency vehicle operators must be well trained and exercise mature judgment in observing traffic laws under emergency conditions.

b. There are risks involving the emergency equipment typically found on emergency vehicles. All emergency equipment and systems must be operationally ready, calibrated, fully charged, and capable of performing the mission. Of special concerns are systems like defibrillators, radios, oxygen tanks (filled), and medications. Medications must not be allowed to become out dated. In addition, they must be stored in accordance with the manufacturer's directions. Otherwise, they could deteriorate from extreme hot or cold temperatures that sometimes occur inside parked ambulances.

10–13. Air ambulance

Most Army hospitals are responsible for operating and maintaining a heliport. Foreign object damage, landing lights, wind socks, radios, static fire suppression equipment, and noise hazards involve safety considerations associated with heliport operations. Also, air crash emergency response plans are normally required and these plans require safety input.

10–14. Gases

Several gases having special risks are commonly found in healthcare settings and have special storage requirements (see fig 10–1). Waste anesthetic gases are a concern. Over exposure of staff to anesthetic gases escaping from patients (human or animal) give rise to several concerns.

a. First, repeated exposure to anesthetic gases can increase the risk of disease (cancer).

b. Second, if waste gas scavenging systems fail to perform properly, the medical staff could unknowingly become partially anesthetized that might result in their making potentially fatal errors.

Figure 10–1. Example of gas storage

c. Lastly, oxygen and nitrous oxide, typically used for relative analgesia and as a component of general anesthesia, are strong oxidizing gases and individually or as a mixture readily support combustion.

(1) A severe hazard exists if either oxygen or nitrous oxide leaks into a closed space, creating an oxygen-enriched atmosphere.

(2) In an oxygen-enriched atmosphere, materials that are flammable and combustible in air, ignite more easily and burn more vigorously. Such materials found on or near patients include hair oils, oil-based lubricants, skin lotions, clothing, linens, paper, rubber, alcohols, acetone, and some plastics.

(3) In addition, a hazard exists if any of the components of an oxygen or nitrous oxide supply system becomes contaminated with oil or grease.

(4) Oxygen-enriched atmospheres are usually an essential component of respiratory therapy. The prevention of fire in oxygen-enriched atmospheres revolves around the elimination of any sources of ignition or flammable substances within this atmosphere.

(a) The most likely sources for ignition come from patients trying to smoke, sparking toys given to children in pediatric wards, or malfunctioning medical safety equipment.

(b) Sources of ignition of oxygen-enriched atmospheres can also include electric heating coils or adiabatic heating of gases.

d. Also, there is the hazard of compressed gas cylinders becoming accidentally punctured (see fig 10–2). This typically results when the cylinders are not secured from falling or are mishandled. A punctured compressed gas cylinder can become an unguided missile that damages or destroys equipment as well as injuring or killing people.

Figure 10–2. A bank of oxygen cylinders

10–15. Material handling equipment

Healthcare activities include warehousing of medical supplies. Hazards typical to warehousing and handling supplies including forklift operation must be evaluated and the associated risks managed. Safety managers must ensure that the training is complete and that the drivers know the rules of proper operation of material handling equipment (MHE). The warehouse should be considered for the quarterly high-interest area safety inspections schedule, if needed.

10–16. Sharps

Injuries caused by punctures or cuts are common to healthcare activities. Incorporate safety measures, such as safe needle devices, whenever possible in accordance with OSHA and CDC guidelines (see fig 10–3).

a. Needle sticks and punctures are a concern in surgery, clinics, wards, laboratories, and morgues.

b. Cuts occur in the use of food processing equipment in healthcare food preparation areas, as well as from using tools in medical maintenance shops, brace shops, and occupational therapy clinics.

c. Always put sharps in the appropriate sharps disposal container (see fig 10–4).

Figure 10–3. Example of a biological waste disposal container

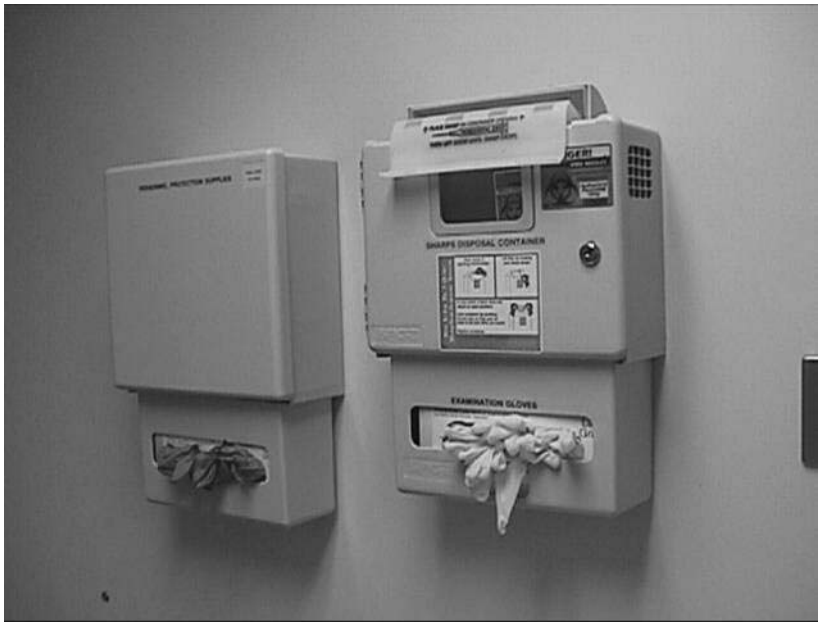

Figure 10–4. Example of a sharps disposal container

10–17. Noise

Elevated levels of noise capable of producing noise-induced hearing loss are common.

a. Noise levels over 80 A-weighted decibels (dBA) and up to 110 dBA have been measured in food preparation areas, medical laboratories, mechanical and power plant rooms, medical records offices, floor nursing units, print shops and maintenance areas.

b. One of the more significant causes of noise will be from the use of a back up power generator. Other noise sources might be chillers, boilers, mechanical rooms, and so forth.

10–18. Respiratory

In addition to the respiratory hazards associated with pathogens mentioned above, dusts from grinding and fabricating dental and other prosthesis may require respiratory protection. Typically, a full-blown respiratory protection program is a requirement for healthcare activities. Annual testing of respirators is required.

Chapter 11
Electrical Safety

11–1. Electrical safety standards

Every effort will be made to maintain an electrically safe environment within the medical facility and its grounds.

a. Specific design and construction standards for electrical distribution systems are contained in MIL–Handbook (HDBK) 1191. (See fig 11–1 for an example of an electrical distribution system.)

b. Testing of the electrical distribution system and electrically operated equipment is specified in NFPA 99 and TM 5–683.

c. The effectiveness of the grounding system shall be evaluated before acceptance, and initially, if never before performed. This evaluation will be documented and repeated when major modifications to the electrical systems are made (NFPA 70 and 99).

Figure 11–1. Example of electric control panel

11–2. Extension cords

The use of electrical extension cords will be minimized in patient care areas.

a. If extension cords are necessary, they will be heavy duty, three-conductor cords with Underwriters Laboratory (UL) Hospital Grade connectors.

b. Two-wire extension cords are prohibited in any patient care area.

c. Metallic-bodied two or three blade end connectors are also prohibited.

d. Extension cords of any type are prohibited in areas where flammables are used or stored (see NEC Code Article 517).

e. Individual hospital policy will be developed and documented regarding the use of extension cords (NFPA 99).

f. Multiple plug adapters are prohibited except when combined with a surge suppresser and used with computer equipment or when used by qualified electronic technicians in the performance of essential maintenance programs.

11–3. Electrical equipment grounding

With the exception of double-insulated appliances, all electrical equipment used in patient care areas will be grounded as specified in NFPA 99.

a. Grounding and leakage requirements for electrically operated equipment will be according to NFPA 99 or the appropriate NFPA code or standard.

b. In the event of conflict, the more restrictive directive will apply.

11–4. Pediatric wards

Pediatric locations (wards, rooms, or areas) will be supplied with tamper resistant receptacles or shall employ a listed tamper resistant cover.

a. Covers that are not listed tamper-resistant are not permitted and shall not be used to cover receptacles in pediatric locations (see fig 11–2).

b. The MTF safety managers or facility managers should do a risk assessment to determine if other locations need tamper-resistant receptacles, for example, waiting areas for family medicine, unit control center, or other clinic with a potential for unsupervised children.

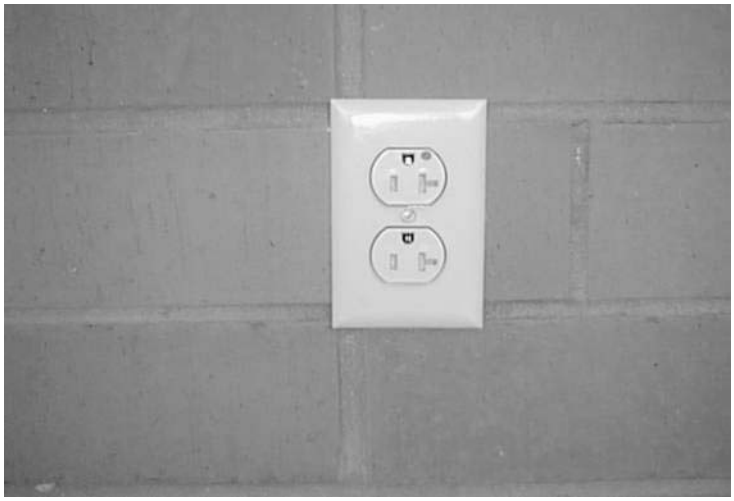

Figure 11–2. Example of tamper-resistant receptacles

Chapter 12
Stress

12–1. Introduction

Healthcare delivery activities require coping with some of the most stressful situations found in any workplace.

a. Hospital workers must deal with life-threatening injuries and illnesses complicated by overwork, understaffing, tight schedules, paperwork, intricate or malfunctioning equipment, complex hierarchies of authority and skills, dependent and demanding patients, and patient deaths.

b. Also, the increasing size and bureaucracy of hospitals may depersonalize the environment and leave many workers feeling isolated, fatigued, angry, powerless, and frustrated.

c. As early as 1977, NIOSH identified the high incidence of stress related problems among hospital workers. The NIOSH study revealed the 22 occupations with the highest admission rates for mental disorders, six of those were from healthcare occupations. The six were health technologists, licensed practical nurses (LPNs), clinical laboratory technicians, nurses' aides, health aides, registered nurses (RNs), and dental assistants. Another study reported the proportional mortality ratio (PMR) for suicide was elevated for male dentists, physicians, medical and dental technologists, veterinarians, and female nurses.

d. In addition, studies have indicated that hospital food service work should be considered a high-stress occupation.

e. In general, workers are most likely to encounter severe stress in intensive care units, burn units, emergency rooms, and operating rooms.

12–2. Prevention

While many factors can individually or in combination contribute to stress, methods for coping are limited. Coping methods include—

a. Regular staff meetings and discussions to communicate feelings, gain support, and share innovative ideas.

b. Utilization of chaplain services organic to most healthcare organizations. Chaplains offer readily available counseling from a nonjudgmental source.

c. Flexibility and innovation by supervisors to create alternative job arrangements.

d. Adequate staffing.

e. Reasonable shift schedules to allow adequate time for sleep each day.

f. Group therapy for staff with particularly difficult professional problems such as dealing with cancer patients, chronic illness, and death.

g. Organized and efficient work functions and environment.

h. Recognition of and action on legitimate complaints regarding overbearing physicians and supervisors.

i. Frequent in-service educational sessions to improve skills and confidence.

j. More flexibility and worker participation in scheduling work shifts.

k. Scheduled rotation of unit assignments.

Appendix A
References

Section I
Required Publications

AR 40–5
Preventive Medicine (Cited in para 6–2*a*(5).)

AR 385–10
The Army Safety Program (Cited in paras 2–1, 7–5*a*(4), 10–3*b*, 10–3*c*.)

DA PAM 385–24
Radiation Safety (Cited in para 7–5*a*(4).)

DA PAM 385–30
Mishap Risk Management (Cited in para 6–1*e*.)

DODI 6055.1
DOD Safety and Occupational Health Program (Cited in para 10–11*c*.)

Section II
Related Publications

A related publication is a source of additional information. The user does not have to read it to understand this publication. CFR publications are available at http://www.gpoaccess.gov/. DOD Instructions are available at http://www.dtic.mil/whs/directives/CGA Pamphlets are available at http://www.cganet.com/. FPA codes, standards, and pamphlets are available from NFPA, Publications Service Department, 60 Battery March Street, Boston, MA 02110, or the Compressed Gas Association Inc., 500 Fifth Avenue, New York, NY 10036.

AR 40–5
Preventive Medicine

AR 40–10
Health Hazard Assessment Program in Support of the Army Material Acquisition Decision Process

AR 385–10
The Army Safety Program

AR 600–63
Army Health Promotion

DA PAM 40–18
Personnel Dosimetry Guidance and Dose Recording Procedures for Personnel Occupationally Exposed to Ionizing Radiation

DA PAM 385–24
Radiation Safety

DA PAM 385–30
Mishap Risk Management

29 CFR 1910.101–105
Occupational Safety and Health Standards

29 CFR 1904
Recording and Reporting Occupational Injuries and Illness

29 CFR 1960
Basic Program Elements For Federal Employee Occupational Safety and Health Programs and Related Matters

AFMAN 23–110V5
Air Force Medical Materiel Management System. (Available at http://www.e-publishing.af.mil.)

ANSI A17.2
Guide for the Inspection of Elevators, Escalators, and Moving Walks. (Available at http://ansi.org/.)

ANSI Z358.1
Emergency Eye Wash and Shower Equipment. (Available at http://ansi.org/.)

CDC/NIH
Primary Containment for Biohazards: Selection, Installation and use of Biological Safety Cabinets. (Available at http://www.cdc.gov.)

CGA Pamphlet G–4
Oxygen

CGA Pamphlet P–l
Safe Handling of Compressed Gases in Containers

CGA Pamphlet P–2
Characteristics and Safe Handling of Medical Gases

CGA Pamphlet P–2–l
Standard for Medical Vacuum Systems in Hospitals

CGA Pamphlet P–4
Safe Handling of Cylinders by Emergency Rescue Squads

DLAR 1000.28
Occupational Ionizing Radiation Personnel Dosimetry. (Available at http://www.dla.mil/dlaps/dlarlistall.asp.)

DODI 1010.15
Smoking in the Army Facilities

DODI 6055.2
Personal Protective Equipment

EO 12196
Occupational Safety and Health Programs for Federal Employees. (Available at http://www.archives.gov/federal-register/codification/executive-order/12196.html.)

JCAHO Manual
Comprehensive Accreditation Manual for Hospitals: The Official Handbook. (Available at http://www.jcrinc.com.)

JCAHO Publication
Environment of Care Essentials for Health Care. (Available at http://www.jcrinc.com.)

MIL–Handbook (HDBK) –1191
Department of Defense, Military Construction Program Facilities, Design and Construction Criteria

NEC Article 517
Health Care Facilities. (Available at http://www.nfpa.org.)

NFPA 30
Flammable and Combustible Liquids Code

NFPA 45
Standard on Fire Protection for Laboratories Using Chemcials

NFPA 50
Bulk Oxygen Systems at Consumer Sites

NFPA 53M
Fire Hazards in Oxygen Enriched Atmospheres

NFPA 70
National Electrical Code(r)

NFPA 99
Standard for Healthcare Facilities

NFPA 101
Life Safety Code and Handbook Set

NFPA 110
Standard for Emergency and Standby Power System

NIOSH Publication 97–117
NIOSH: Elements of Ergonomics (Available at http://www.osha.gov/.)

NSF Standard 49
Class II (Laminar Flow) Biological Cabinetry. (Available at http://www.niehs.nih.gov.)

TB MED 521
Occupational and Environmental Health Management and Control of Diagnostic, Therapeutic, and Medical Research X–Ray Systems and Facilities

TB MED 523
Control of Hazards to Health from Microwave and Radio-frequency Radiation and Ultrasound

TB MED 524
Control of Hazards to Health from Laser Radiation

TB MED 525
Control of Hazards to Health from Ionizing Radiation Used by the Army Medical Department

TM 5–683
Facilities Engineering Electrical Interior Facilities

TM 5–685
Operation, Maintenance, and Repair of Auxiliary Generators

TM 38–410
Chemical Safety

USAEHA TG No. 153
Guidelines for Controlling Potential Health Hazards from Radio Frequency Radiation. (This publication is available from the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB–CI–O, Aberdeen Proving Ground, MD 21015–5422.)

Section III
Prescribed Forms
This section contains no entries.

Section IV
Referenced Forms
Unless otherwise indicated, DA Forms are available on the APD Web site (www.apd.army.mil).

DA Form 2028
Recommended Changes to Publications and Blank Forms

DA Form 4753
Notice No. of Unsafe or Unhealthful Working Conditions

DA Form 4755
Employee Report of Alleged Unsafe or Unhealthful Working Conditions

DA Form 4756
Installation Hazard Abatement Plan

DOL Form CA–1
Federal Employees's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation (Available at http://www.dol.gov/libraryforms/.)

OSHA Form 300
Log of Work-Related Injuries and Illnesses (Available at http://www.osha.gov/pls/publications/pubindex.list.)

Glossary

Section I
Abbreviations

AAMI
Association for the Advancement of Medical Instrumentation

AFMAN
Air Force Manual

ANSI
American National Standards Institute

ASHRAE
American Society of Heating, Refrigerating and Air-Conditioning Engineers

ATS
Automatic transfer switch

BSC
Biological safety cabinet

CAP
College of American Pathology

CDC
Center for Disease Control

CFR
Code of Federal Regulation

CGA
Compressed Gas Association

CMS
Central material supply

CPAC
Civilian Personnel Advisory Center

DA
Department of the Army

DLAR
Defense Logistics Agency Regulation

DODI
Department of Defense Instruction

DPW
Department of Public Works

EC
environment of care

EO
Executive Order

EOCC
Environment of care committee

EPA
Environmental Protection Agency

EPSS
Emergency power supply systems

ER
Emergency room

ESU
Electrical surgical unit

ETO
Ethylene oxide

FAA
Federal Aviation Administration

GS
General Schedule

HDBK
Handbook

HEPA
High-efficiency particulate air

HVAC
Heating, ventilating, and air conditioning

ICSE
Information collection for system evaluation

IESNA
Illuminating Engineering Society Standards of North America

JCAHO
Joint Commission on Accreditation of Healthcare Organizations

JSA
job safety analysis

LPN
Licensed practical nurse

LSC
Life Safety Code

LSO
Laser Safety Officer

MHE
Material handling equipment

MRI
Magnetic resonance imaging

MTF
Medical treatment facility

NEC
National Electrical Code

NFPA
National Fire Protection Association

NIH
National Institutes of Health

NIOSH
National Institute for Occupational Safety and Health

NRC
Nuclear Regulatory Commission

NSF
National Sanitation Foundation

OPM
Office of Personnel Management

OR
Operating Suites

ORCMS
Operating Room Central Material Supply

OSHA
Occupational Safety and Health Administration

OWCP
Office of Workers' Compensation Programs

PIM
Performance improvement measure

PMR
proportional mortality ratio

POCs
Point of contracts

RAC
Risk assessment code

RF
Radiofrequency

RN
Registered Nurse

RSO
Radiation Safety Officer

SJA
Staff Judge Advocate

SOC
Statement of Conditions

SOH
Safety and occupational health

SOHAC
Safety & Occupational Health Advisory Committee

TLD
Thermoluminescent dosimeter

TM
US Army Technical Manual

TO
Technical orders

TSG
The Army Surgeon General

UL
Underwriters Laboratory

USACHPPM
United States Army Center for Health Promotion and Preventive Medicine

USAEHA
United States Army Environmental Hygiene Agency

USAMEDCOM
United States Army Medical Command

WAG
Waste anesthesia gas

WAGE
Waste anesthesia gas evacuation

Section II
Terms

Accident
Any unplanned event or series of events that results in death, injury, or illness to personnel, or damage to or loss of equipment or property (Within the context of this PAM, accident is synonymous with mishap.)

Acid
Any of a class of substances whose aqueous solutions is characterized by a sour taste, the ability to turn blue litmus red, and the ability to react with bases and certain metals to form salts.

Anesthesia
Local or general insensibility to pain with or without the loss of consciousness, induced by an anesthetic (a drug that induces partial or total loss of sensation and may be topical, local, regional, or general, depending on the method of administration and area of the body affected).

Antineoplastic
Any of several drugs that controls or kills neoplastic cells; used in chemotherapy to kill cancer cells. All have unpleasant side effects that include nausea, vomiting, hair loss, and suppression of bone marrow function.

Automatic transfer switches
Self-acting equipment for transferring one or more load conductor connections from one power source to another.

Autoclave
A pressurized apparatus or device that allows for the heating of aqueous solutions to temperatures above water's boiling point; is used for sterilization, especially surgical instruments.

Biological safety cabinet
A totally enclosed, ventilated cabinet of gas-light construction that offers the highest degree of personnel and environmental protection from infectious aerosols, as well as protection of research materials from microbiological contaminants. It offers primary containment of biohazards.

Carcinogenic
A chemical or substance that produces or incites cancer.

Centrifuge
A piece of laboratory equipment that applies centrifugal force to a sample. Generally, a motor drives the rotary motion of the sample.

Class A. Fire
A fire Involving ordinary combustible materials such as wood, paper, and rubbish.

Class B. Fire
A fire involving combustible fuels, hydrocarbons, organic solvents, and so forth.

Class C. Fire
A fire involving electrical equipment-basically, an electric fire.

Class D. Fire
A fire involving combustible metals such as, Sodium, magnesium, titanium, potassium, uranium, and so forth.

Collimator
A device that restricts and confines an X-ray beam to a given area by filtering a stream of rays so that only those traveling parallel to a specified direction are allowed through.

Combustible material
Definitions include:

a. Material, solid or liquid, capable of igniting and burning.

b. Combustible solids are those capable of igniting and burning. Wood and paper are examples of such materials. A combustible liquid is any liquid having a flash point at or above 100 degrees Fahrenheit (37.8 degrees Celsius), but below 200 degrees Fahrenheit (93.3 degrees Celsius), except any mixture having components with flashpoints of 200 degrees Fahrenheit (93.3 degrees Celsius), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Corrosive liquids
Corrosive liquids (for example, mineral acids, alkali solutions and some oxidizers) represent a very significant hazard because skin or eye contact can readily occur from splashes and their effect on human tissue generally takes place very rapidly, e.g., bromine, sodium hydroxide, sulfuric acid and hydrogen peroxide.

Emergency room
A room in a hospital or clinic staffed and equipped to provide emergency care to persons requiring immediate medical treatment.

Ergonomics
The study of workplace design and the physical and psychological impact it has on workers. Ergonomics is about the fit between people, their work activities, equipment, work systems, and environment to ensure that workplaces are safe, comfortable, and efficient, and that productivity is not compromised.

"Explosion-proof"
Apparatus enclosed in a case that is capable of withstanding an internal burning or explosion of elements inside a case and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion and operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

Flammable liquid
Any liquid having a flash point below 100 degrees Fahrenheit (37.8 degrees Celsius), except any mixture having components with flash points of 100 degrees Fahrenheit (37.8 degrees Celsius) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids.

Flammable materials
Material that can be readily ignited and rapidly burned.

Foot-candles
A unit of measure of the intensity of light falling on a surface, equal to one lumen per square foot and originally defined with reference to a standardized candle burning at one foot from a given surface.

Formaldehyde
A chemical used in manufacturing chemical industries and used as a preservative by anatomists, embalmers, and pathologists. Being exposed to formaldehyde may increase the risk of developing leukemia and brain cancer. A colorless, flammable gas with a pungent irritating odor that is used chiefly as a disinfectant, and tissue preservative, and in synthesizing other compounds like resins.

Glutaraldehyde
A water-soluble oily liquid, OHC(CH2)3CHO, containing two aldehyde groups, that is used as a fixative for biological tissues and in tanning leather.

Grounding
The electrically interconnected system of conductors and conductive elements that provides multiple current paths to the earth.

Hazards
In Occupational and Environmental epidemiology, it should be defined as the potential to cause harm.

High-efficiency particulate air filter
Type of an air filter that removes >99.97% of particles 0.3 um or larger at a specified flow rate of air.

Imminent danger
Conditions or practices in any workplace that pose a danger that reasonably could be expected to cause death or severe physical hardship before the imminence of such danger could be eliminated through normal procedures.

Microtome
A mechanical instrument used to cut very thin slices of tissue for microscopic examination. Most microtomes use a steel blade and are used to prepare sections of animal, plant or human tissues for histology.

Musculoskeletal
The system of muscles, tendons, ligaments, bones, joints, and associated tissues that move the body and maintain its form.

Mutagenic
A substance which can cause changes in the DNA of cells (mutations).

Nonflammable
Not flammable, especially not readily ignited and not readily burned.

Nosocomial infection
An infection acquired in a hospital. Specifically an infection that was not present or incubating prior to the patient being admitted to the hospital, but occurred within 72 hours after admittance to the hospital.

Operating room
A room in a hospital equipped for the performance of surgical operations; "great care is taken to keep the operating rooms aseptic."

Pipetting
The process of suctioning small amounts of liquid into a narrow, usually calibrated glass tube.

Radioisotopes
Naturally or artificially produced radioactive isotope of an element.

Sterilizers
An apparatus used for rendering objects aseptic; a device used for sterilizing surgical instruments at high temperature and high pressure.

Teratogenic
Able to disturb the growth and development of an embryo or fetus.

Thermoluminescent dosimeter
A device used to measure radiation dose to occupational workers or radiation levels in the environment. A dosimeter made of one or more lithium fluoride chips that measure cumulative exposure to ionizing radiation. Lithium fluoride absorbs the energy of radiation and when heated, releases it as light.

Toxic materials
Materials that have the capacity of producing harmful effects.

Section III
Special Abbreviations and Terms
This section contains no entries.

USAPD

ELECTRONIC PUBLISHING SYSTEM
OneCol FORMATTER WIN32 Version 238

PIN: 083960–000
DATE: 09- 4-07
TIME: 08:52:10
PAGES SET: 45

DATA FILE: C:\Wincomp\p385-80.fil
DOCUMENT: DA PAM 385–80

SECURITY: UNCLASSIFIED
DOC STATUS: NEW PUBLICATION